

Automotive Relays

CB RELAYS

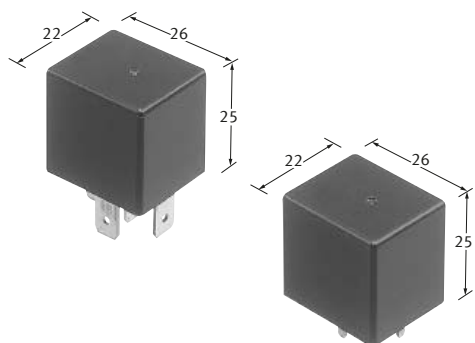
Product Catalog

**IN Your
Future**

CB RELAYS

Mini-ISO Automotive Relay

◁ Protective construction ▷
Flux tight/Sealed



(Unit: mm)

FEATURES

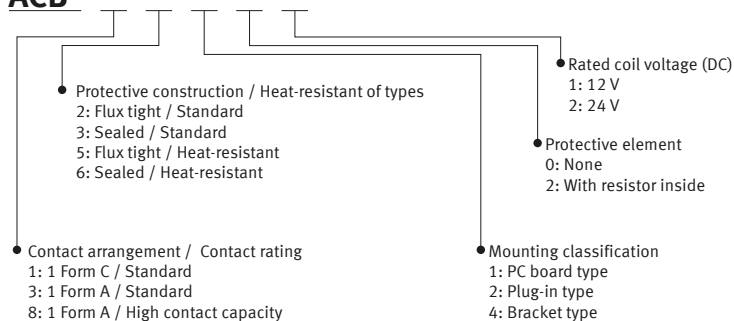
- This relay has an Mini-ISO (International Organization for Standardization) terminal arrangement.
- Compact and high capacity
- Features heat-resistant type
- Built-in resistor type is also available.

TYPICAL APPLICATIONS

- Automobiles
Cell motors, Air compressor, ABS, EPS, etc.
- Construction equipment
- Agricultural equipment, Conveyor, etc.

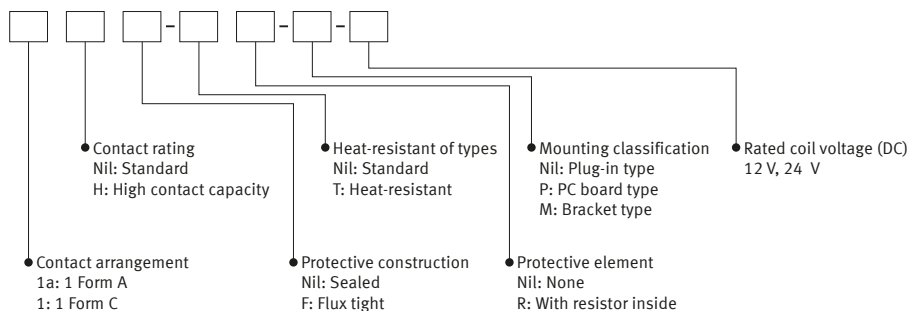
ORDERING INFORMATION (PART NO. : Ordering part number for Japanese market)

ACB



ORDERING INFORMATION (TYPE NO. : Ordering part number for non Japanese market)

CB



Automotive Relays CB RELAYS

TYPES

" Type No. " is ordering part number for non Japanese market. " Part No. " is ordering part number for Japanese market.

Contact arrangement	Mounting classification	Rated coil voltage	Standard type				High heat-resistant type				Packing	
			Sealed		Flux tight		Sealed		Flux tight		Carton	Case
			Type No.	Part No.	Type No.	Part No.	Type No.	Part No.	Type No.	Part No.		
1 Form A	PC board type	12 V DC	CB1a-P-12V	ACB33101	CB1aF-P-12V	ACB32101	CB1a-T-P-12V	ACB36101	CB1aF-T-P-12V	ACB35101	50 pcs.	200 pcs.
		24 V DC	CB1a-P-24V	ACB33102	CB1aF-P-24V	ACB32102	CB1a-T-P-24V	ACB36102	CB1aF-T-P-24V	ACB35102		
	Plug-in type	12 V DC	CB1a-12V	ACB33201	CB1aF-12V	ACB32201	CB1a-T-12V	ACB36201	CB1aF-T-12V	ACB35201		
		24 V DC	CB1a-24V	ACB33202	CB1aF-24V	ACB32202	CB1a-T-24V	ACB36202	CB1aF-T-24V	ACB35202		
	Bracket type	12 V DC	CB1a-M-12V	ACB33401	CB1aF-M-12V	ACB32401	CB1a-T-M-12V	ACB36401	CB1aF-T-M-12V	ACB35401		
		24 V DC	CB1a-M-24V	ACB33402	CB1aF-M-24V	ACB32402	CB1a-T-M-24V	ACB36402	CB1aF-T-M-24V	ACB35402		
1 Form C	PC board type	12 V DC	CB1-P-12V	ACB13101	CB1F-P-12V	ACB12101	CB1-T-P-12V	ACB16101	CB1F-T-P-12V	ACB15101		
		24 V DC	CB1-P-24V	ACB13102	CB1F-P-24V	ACB12102	CB1-T-P-24V	ACB16102	CB1F-T-P-24V	ACB15102		
	Plug-in type	12 V DC	CB1-12V	ACB13201	CB1F-12V	ACB12201	CB1-T-12V	ACB16201	CB1F-T-12V	ACB15201		
		24 V DC	CB1-24V	ACB13202	CB1F-24V	ACB12202	CB1-T-24V	ACB16202	CB1F-T-24V	ACB15202		
	Bracket type	12 V DC	CB1-M-12V	ACB13401	CB1F-M-12V	ACB12401	CB1-T-M-12V	ACB16401	CB1F-T-M-12V	ACB15401		
		24 V DC	CB1-M-24V	ACB13402	CB1F-M-24V	ACB12402	CB1-T-M-24V	ACB16402	CB1F-T-M-24V	ACB15402		
1 Form A High contact capacity	PC board type	12 V DC	CB1aH-P-12V	ACB83101	CB1aHF-P-12V	ACB82101	CB1aH-T-P-12V	ACB86101	CB1aHF-T-P-12V	ACB85101		
		24 V DC	CB1aH-P-24V	ACB83102	CB1aHF-P-24V	ACB82102	CB1aH-T-P-24V	ACB86102	CB1aHF-T-P-24V	ACB85102		
	Plug-in type	12 V DC	CB1aH-12V	ACB83201	CB1aHF-12V	ACB82201	CB1aH-T-12V	ACB86201	CB1aHF-T-12V	ACB85201		
		24 V DC	CB1aH-24V	ACB83202	CB1aHF-24V	ACB82202	CB1aH-T-24V	ACB86202	CB1aHF-T-24V	ACB85202		
	Bracket type	12 V DC	CB1aH-M-12V	ACB83401	CB1aHF-M-12V	ACB82401	CB1aH-T-M-12V	ACB86401	CB1aHF-T-M-12V	ACB85401		
		24 V DC	CB1aH-M-24V	ACB83402	CB1aHF-M-24V	ACB82402	CB1aH-T-M-24V	ACB86402	CB1aHF-T-M-24V	ACB85402		

Note) Please use " CB***R** " to order with resistor inside type. (Asterisks " * " should be filled in from ORDERING INFORMATION.)

RATING

■ Coil data

1) No protective element

Contact arrangement Contact rating	Rated coil voltage	Operate voltage (at 20 °C) (Initial)	Release voltage (at 20 °C) (Initial)	Rated operating current [±10 %] (at 20 °C)	Coil resistance [±10 %] (at 20 °C)	Rated operating power (at 20 °C)	Usable voltage range
1 Form A, 1 Form C	12 V DC	3 to 7 V DC	1.2 to 4.2 V DC	117 mA	103 Ω	1.4 W	10 to 16 V DC
	24 V DC	6 to 14 V DC	2.4 to 8.4 V DC	75 mA	320 Ω	1.8 W	20 to 32 V DC
1 Form A High contact capacity	12 V DC	3 to 7 V DC	1.2 to 4.2 V DC	117 mA	103 Ω	1.4 W (PC board type)	10 to 16 V DC
				150 mA	80 Ω	1.8 W	
	24 V DC	6 to 14 V DC	2.4 to 8.4 V DC	58 mA	411 Ω	1.4 W (PC board type)	20 to 32 V DC
				75 mA	320 Ω	1.8 W	

Note) Other operate voltage types are also available. Please inquire our sales representative for details.

2) With resistor inside

Contact arrangement Contact rating	Rated coil voltage	Operate voltage (at 20 °C) (Initial)	Release voltage (at 20 °C) (Initial)	Rated operating current [±10 %] (at 20 °C)	Equivalent coil resistance [±10 %] (at 20 °C)	Rated operating power (at 20 °C)	Usable voltage range
1 Form A, 1 Form C	12 V DC	3 to 7 V DC	1.2 to 4.2 V DC	134 mA	89.5 Ω	1.6 W	10 to 16 V DC
	24 V DC	6 to 14 V DC	2.4 to 8.4 V DC	84 mA	287.2 Ω	2.0 W	20 to 32 V DC
1 Form A High contact capacity	12 V DC	3 to 7 V DC	1.2 to 4.2 V DC	134 mA	89.5 Ω	1.6 W (PC board type)	10 to 16 V DC
				168 mA	71.6 Ω	2.0 W	
	24 V DC	6 to 14 V DC	2.4 to 8.4 V DC	67 mA	358 Ω	1.6 W (PC board type)	20 to 32 V DC
				84 mA	287.2 Ω	2.0 W	

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■ Specifications

1) Standard type (12 V coil voltage)

Standard type (12 V coil voltage)		Item			Specifications		
Contact data	Contact arrangement	1 Form A		1 Form C		1 Form A High contact capacity	
	Contact resistance (initial)	Max. 15 mΩ (Typ. 2 mΩ) (by voltage drop 1 A 6 V DC)					
	Contact material	Ag alloy					
	Rated switching capacity (resistive)	40 A 14 V DC		N.O. side: 40 A 14 V DC N.C. side: 30 A 14 V DC		70 A 14 V DC (at 20 °C) 50 A 14 V DC (at 85 °C)	
	Max. carrying current* ¹ (coil applied voltage 14 V DC, at 85 °C, continuous)	N.O. side: 40 A		N.O. side: 40 A N.C. side: 30 A		N.O. side: 40 A	
	Min. switching load (resistive) * ²	1 A 14 V DC (at 20 °C)					
Insulated resistance (initial)		Min. 20 MΩ (at 500 V DC, Measurement at same location as " Dielectric strength " section.)					
Dielectric strength (initial)	Between open contacts	500 Vrms for 1 min (Detection current: 10 mA)					
	Between contacts and coil	500 Vrms for 1 min (Detection current: 10 mA)					
Time characteristics (initial)	Operate time (at rated voltage)	Max. 15 ms (at 20 °C, without contact bounce time)		Max. 15 ms (at 20 °C, without contact bounce time)		Max. 15 ms (at 20 °C, without contact bounce time)	
	Release time (at rated voltage)	Max. 15 ms (at 20 °C) (without diode)		Max. 15 ms (at 20 °C, without contact bounce time) (without diode)		Max. 15 ms (at 20 °C) (without diode)	
Shock resistance	Functional	Min. 200 m/s ² (Half-wave pulse of sine wave: 11 ms, detection time: 10 μs)					
	Destructive	Min. 1,000 m/s ² (Half-wave pulse of sine wave: 6 ms)					
Vibration resistance	Functional	10 to 500 Hz, Min. 44.1 m/s ² (Detection time: 10 μs)					
	Destructive	10 to 2,000 Hz, Min. 44.1 m/s ² (Time of vibration for each direction; X, Y, Z direction: 4 hours)					
Expected life	Mechanical	Min. 10 ⁶ (at 120 times/min)					
	Electrical (at rated switching capacity)	Flux tight: Min. 10 ⁵ , Sealed: Min. 5 × 10 ⁴ (operating frequency: 2 s ON, 2 s OFF)					
Conditions	Conditions for usage, transport and storage* ³	Standard: Ambient temperature : -40 to +85 °C, Humidity: 5 to 85% RH (Avoid icing and condensation)					
		Heat-resistant: Ambient temperature: -40 to +125 °C, Humidity: 2 to 85% RH (Avoid icing and condensation)					
Weight		Approx. 33 g					

*1: Depends on connection conditions. Also, this does not guarantee repeated switching. We recommend that you confirm operation under actual conditions.

*2: This value can change due to the switching frequency, environmental conditions, and desired reliability level, therefore it is recommended to check this with the actual load.

*3: The upper operation ambient temperature limit is the maximum temperature that can satisfy the coil temperature rise value. For details, please refer to the " Automotive Relay Users Guide ".
Please inquire our sales representative if you will be using the relay in a high temperature atmosphere (110 °C).

2) Standard type (24 V coil voltage)

Item		Specifications		
Contact data	Contact arrangement	1 Form A	1 Form C	1 Form A High contact capacity
	Contact resistance (initial)	Max. 15 mΩ (by voltage drop 1 A 6 V DC)		
	Contact material	Ag alloy		
	Rated switching capacity (resistive)	20 A 28 V DC	N.O. side: 20 A 28 V DC N.C. side: 10 A 28 V DC	20 A 28 V DC
	Max. carrying current (coil applied voltage 28 V DC, at 85 °C, continuous)	20 A	N.O. side: 20 A N.C. side: 10 A	20 A

Note) All other specifications are the same as those of standard type (12 V coil voltage).

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3) Heat-resistant type (12 V and 24 v coil voltage)

Item		Specifications					
		12 V			24 V		
Contact data	Contact arrangement	1 Form A	1 Form C	1 Form A High contact capacity	1 Form A	1 Form C	1 Form A High contact capacity
	Contact resistance (initial)	Max. 15 mΩ (by voltage drop 1 A 6 V DC)					
	Contact material	Ag alloy					
	Rated switching capacity (resistive)	40 A 14 V DC	N.O. side: 40 A 14 V DC N.C. side: 30 A 14 V DC	70 A 14 V DC	20 A 28 V DC	N.O. side: 20 A 28 V DC N.C. side: 10 A 28 V DC	20 A 28 V DC
	Max. carrying current (at coil applied voltage, at 125 °C, continuous)	50 A 14 V DC	N.O. side: 50 A 14 V DC N.C. side: 30 A 14 V DC	45 A 14 V DC* 50 A 14 V DC*	25 A 28 V DC	N.O. side: 25 A 28 V DC N.C. side: 10 A 28 V DC	25 A 28 V DC*

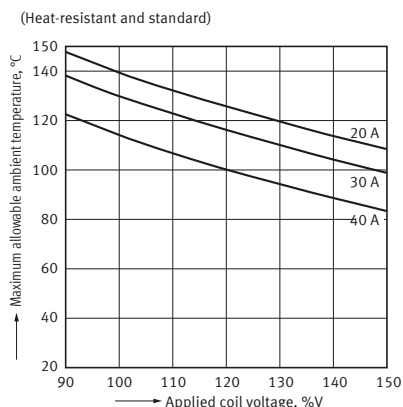
Notes) All other specifications are the same as those of standard (12 V coil voltage) .

*Conditions: at coil applied voltage, at 85 °C, continuous

REFERENCE DATA

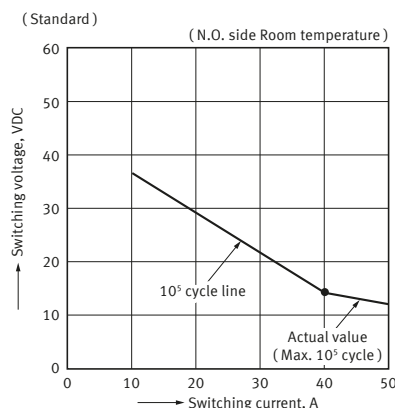
■ CB Relays (Standard)

1. Allowable ambient temperature

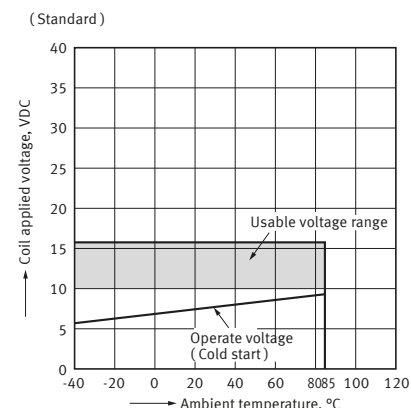


Notes:
 • Maximum mean coil temperature: 180°C
 • Curves are based on 1.4 W (Nominal power consumption of the unsuppressed coil at nominal voltage)

2. Max. switching capability (Resistive)

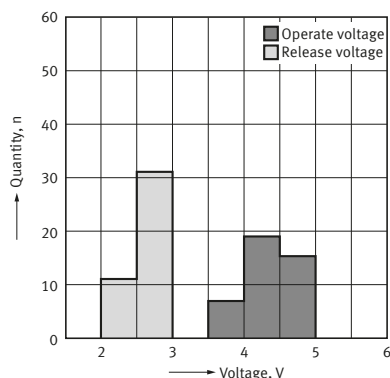


3. Ambient temperature and usable voltage range



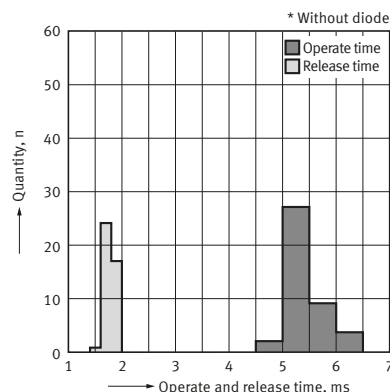
4. Distribution of operate and release voltage

Sample: CB1-P-12V, 42 pcs.



5. Distribution of operate and release time

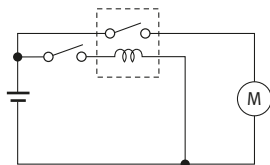
Sample: CB1-P-12V, 42 pcs.



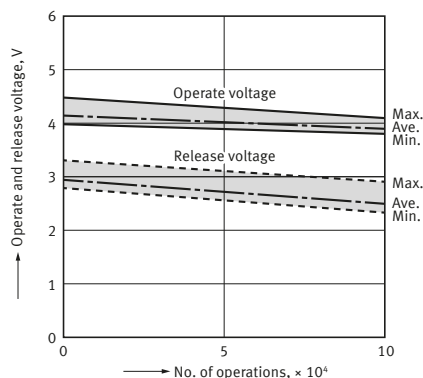
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6. Electrical life test (Motor free)

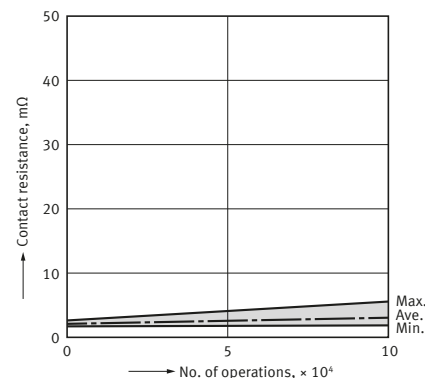
Sample: CB1F-12V, 5 pcs.
Load: 25 A 14 V DC, motor free actual load
Operating frequency: ON 1 s, OFF 9 s
Ambient temperature: Room temperature
Circuit:



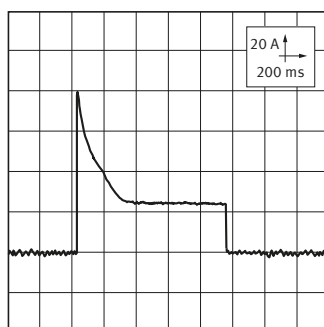
Change of operate and release voltage



Change of contact resistance



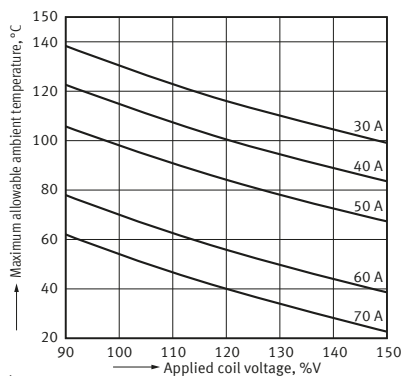
Load current waveform
Load; Inrush current: 80 A, Steady current: 25 A



■ CB Relays (High contact capacity)

1. Allowable ambient temperature

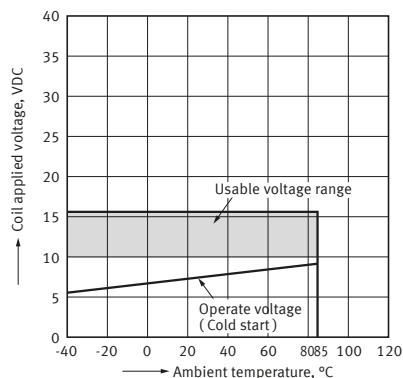
(Heat-resistant and high contact capacity)



Notes:
• Maximum mean coil temperature: 180°C
• Curves are based on 1.4 W (Nominal power consumption of the unsuppressed coil at nominal voltage)

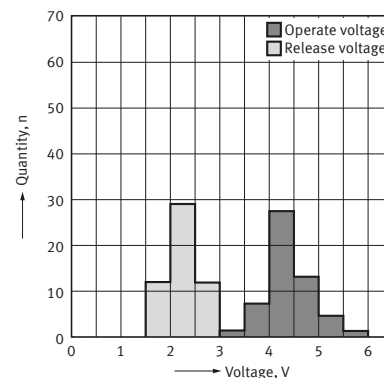
2. Ambient temperature and usable voltage range

(High contact capacity and standard)



3. Distribution of operate and release voltage

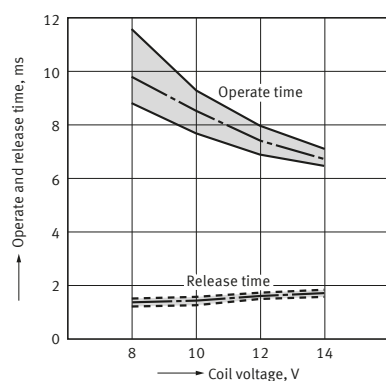
Sample: CB1aHF-12V, 53 pcs.



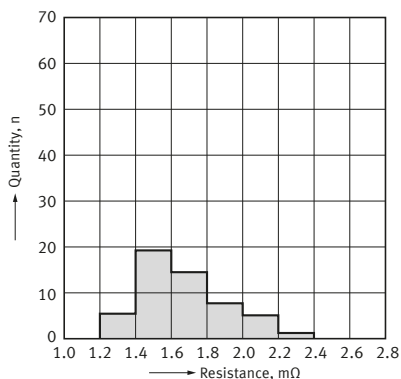
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4. Distribution of operate and release time 5. Contact resistance

Sample: CB1aHF-12V, 53 pcs.

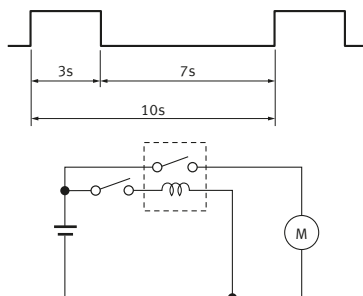


Sample: CB1aHF-12 V, 53 pcs.
(By voltage drop 1 A 6 V DC)

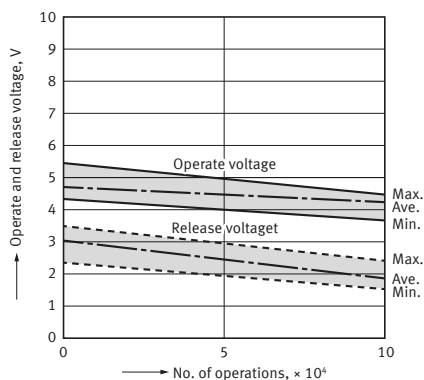


6. Electrical life test (Motor free)

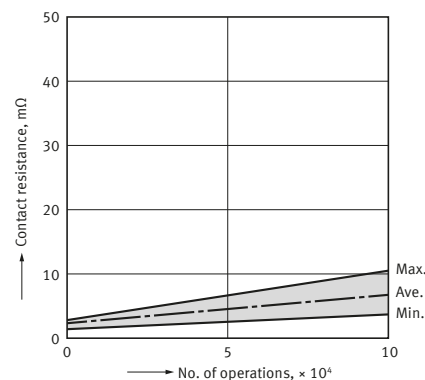
Sample: CB1aH-12V, 3 pcs.
Load: Inrush current: 64 A, Steady current: 35 A
Fan motor actual load (motor free) 12 V DC
Operating frequency: ON 3 s, OFF 7 s
Ambient temperature: Room temperature
Circuit:



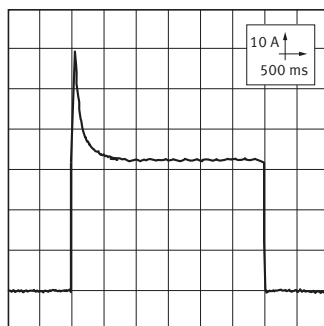
Change of operate and release voltage



Change of contact resistance



Load current waveform
Load; Inrush current: 64 A, Steady current: 35 A



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DIMENSIONS (Unit: mm)

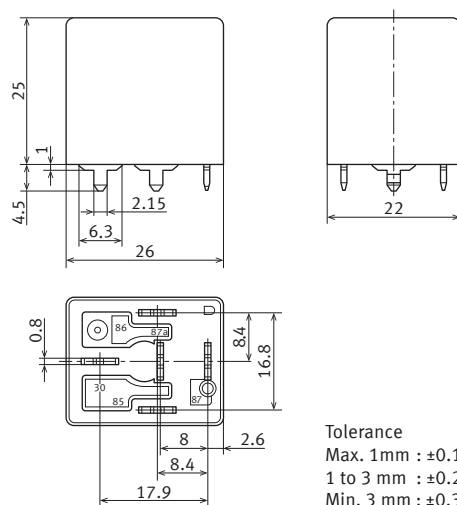
CAD The CAD data of the products with a " CAD " mark can be downloaded from our Website.

■ PC board type

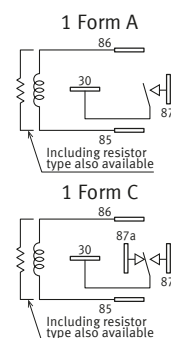
CAD



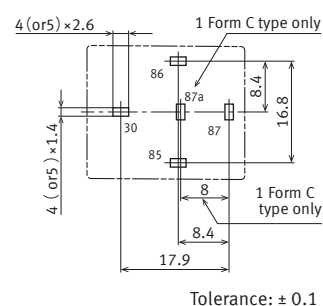
External dimensions



Schematic
(BOTTOM VIEW)



PC board pattern
(BOTTOM VIEW)

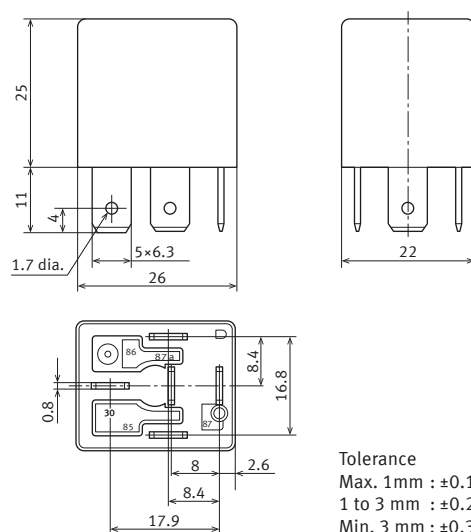


■ Plug-in type

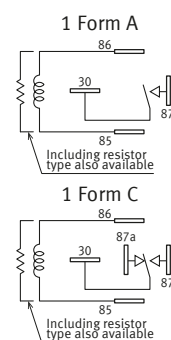
CAD



External dimensions



Schematic
(BOTTOM VIEW)



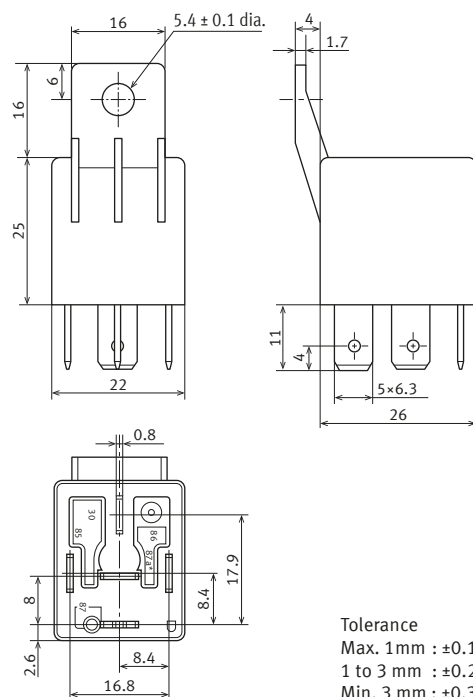
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Bracket type

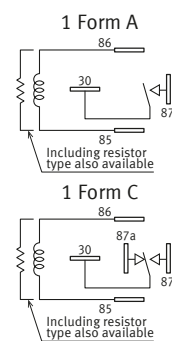
CAD



External dimensions



Schematic
(BOTTOM VIEW)

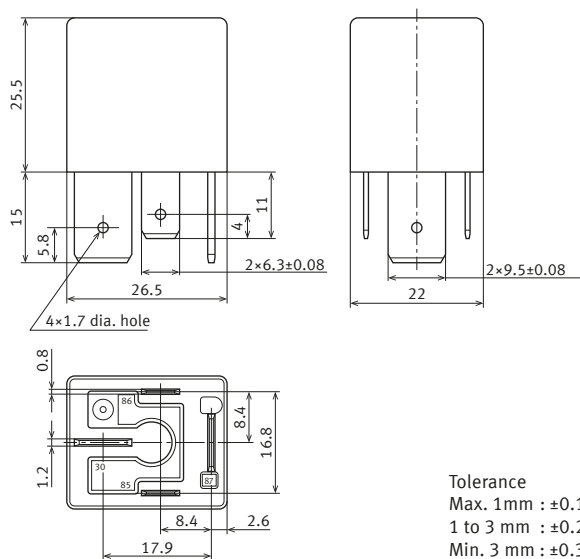


1 Form A high contact capacity (Plug-in type)

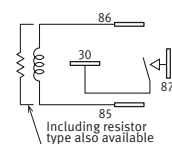
CAD



External dimensions



Schematic
(BOTTOM VIEW)



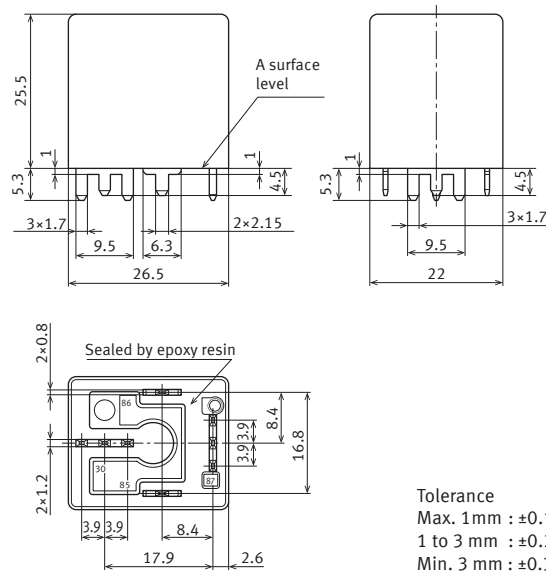
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■ 1 Form A high contact capacity (PC board type)

CAD

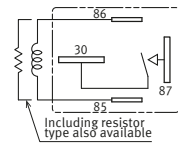


External dimensions

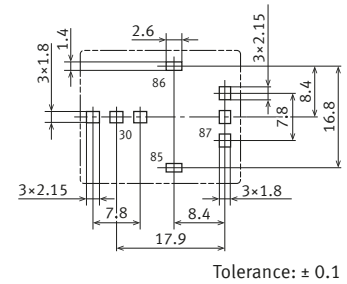


* Intervals between terminals is measured at A surface level.

Schematic
(BOTTOM VIEW)



PC board pattern
(BOTTOM VIEW)



GUIDELINES FOR USAGE

■ For general cautions for use, please refer to the " Automotive Relay Users Guide " .

■ Precautions when using CB relays

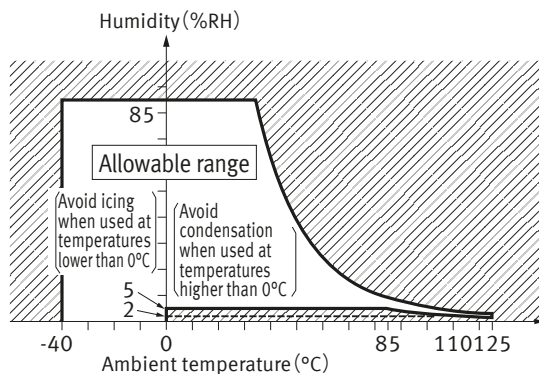
● Soldering

Solder temperature: 350 °C, within 3 s (in a solder bath)
The effect on the relay depends on the actual PC board used. Please verify the PC board to be used.

● Usage, transport and storage conditions

- 1) Ambient temperature, humidity, and air pressure during usage, transport of the relay
 - (1) Temperature: -40 to $+85$ °C (Standard type)
 -40 to $+125$ °C (High heat-resistant type)
 - (2) Humidity: 2 to 85 % RH (Avoid icing and condensation)
 - (3) Air pressure: 86 to 106 kPa
The humidity range varies with the temperature. Use within the range indicated in the graph.

[Temperature and humidity range for usage, transport, and storage]



Please refer to " the latest product specifications " when designing your product.

• Requests to customers:

<https://industry.panasonic.com/global/en/salespolicies>

■ Global Sales Network Information: industry.panasonic.com/global/en/salesnetwork/globalnetwork

Panasonic
INDUSTRY

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